

REMARKS

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering the present application.

I. Disposition of Claims

Claims 1-20 are currently pending in the present application. Claims 1, 6, 11, and 15 have been amended.

II. Claim Amendments

Independent claims 1, 6, 11, and 15 have been amended to recite that the creation or generation of the wire load model is adjustable by selection of an error bound. No new matter has been added by way of these amendments as support for these amendments may be found, for example, in paragraph [0025] of the Specification.

III. Rejection(s) Under 35 U.S.C § 112

In the final Office Action of March 5, 2003, claim 3 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. In response, Applicant filed a reply (dated April 10, 2003), which the Examiner indicated, in the Advisory Action of April 22, 2003, as overcoming the 35 U.S.C. § 112, second paragraph, rejection.

IV. Rejection(s) Under 35 U.S.C § 102

U.S. Patent No. 5,629,860

Claims 15-19 of the present application were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,629,860 issued to Jones et al. (hereinafter "Jones"). For the reasons set forth below, this rejection is respectfully traversed.

The present invention is directed to a technique for generating a wire load model that is useful for timing and noise analyses in an early integrated circuit design stage. The wire load model is derived by the simulation of wires in different layers to obtain parasitic information, which is then curve-fitted to produce the wire load model. As required by independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application, the creation of the wire load model using the curve-fitting engine is adjustable by selection of an error bound. In other words, the curve-fitting engine has an error control mechanism by which an error bound may be specified for a particular curve-fitting. *See* Specification, paragraph [0025]. Via Equations (1)-(4) presented in paragraph [0024] of the Specification, the curve-fitting engine allows one to control error by specifying the amount of error that can be tolerated.

Jones, in contrast to the present invention, fails to disclose, or otherwise teach, the present invention as recited in amended independent claim 15 and independent claim 19 of the present application. Jones, which is directed to a method for determining timing delays of an integrated circuit layout, discloses that average wire length and average wire length variability data as a function of area information is curve fit to an empirically derived formula known as Rent's rule. Jones, column 5, lines 49 – 53. However, Jones fails to show how one of ordinary skill in the art could adjust or control the curve fitting

to account for error tolerance as this would be an important feature for newer technologies. With respect to the portions of Jones relied on in the final Office Action of March 5, 2003 as disclosing means for controlling error, namely, column 5, line 66 – column 8, line 61 of Jones, Jones is completely silent as to how to provide an error tolerance for the curve fitting. Instead, the relied-upon portions of Jones describe how to create a netlist for timing analysis purposes with the only constraints disclosed being design constraints (Jones, column 6, lines 17 – 27), which are entirely distinct from an error bound for a curve-fitting engine as required by amended independent claim 15 and independent claim 19 of the present application.

In view of the above, Jones fails to show or suggest the present invention as recited in amended independent claims 15 and 19 of the present application. Thus, amended independent claims 15 and 19 of the present application are patentable over Jones. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

U.S. Patent No. 5,694,344

Claims 15, 16, and 18 of the present application were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,694,344 issued to Yip et al. (hereinafter “Yip”). For the reasons set forth below, this rejection is respectfully traversed.

Yip, like Jones, fails to disclose the present invention as recited in amended independent claim 15 of the present application. Yip, which is directed to modeling a semiconductor package, discloses a semiconductor package modeling program that inputs a physical description of a semiconductor package and calculates a model comprising a

not
in claim
language

resistor, inductor, and capacitor dependent on the description of the semiconductor package. *See* Yip, column 3, lines 58 – 67. However, Yip is completely silent as to selecting an error bound as part of creating the model as required by amended independent claim 15 of the present application.

In view of the above, Yip fails to show or suggest the present invention as recited in amended independent claim 15 of the present application. Thus, amended independent claim 15 of the present application is patentable over Yip. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

U.S. Patent No. 6,175,947

Claims 1-20 of the present application were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,175,947 issued to Ponnappalli et al. (hereinafter “Ponnappalli”). For the reasons set forth below, this rejection is respectfully traversed.

Ponnappalli, like Jones and Yip, fails to disclose the curve-fitting “error bound” limitation of independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application. Ponnappalli, which is directed to a method for extracting 3-D capacitance and inductance parasitics, discloses a purported curve-fitting engine that approximates models with low-order polynomials. *See* Ponnappalli, column 8, lines 26 – 28. However, Ponnappalli is completely silent as to how to select an error bound for this modeling. With respect to the portions of Ponnappalli relied on in the final Office Action of March 5, 2003 as disclosing means for controlling error, namely, column 12, lines 4 - 6 of Ponnappalli, Ponnappalli describes a correction term that is simply added to a

determined capacitance value in the case of deviant capacitance values. This is entirely distinct from controlling an error bound of a curve-fitting process used to generate a wire load model as required by independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application.

In view of the above, Ponnappalli fails to show or suggest the present invention as recited in independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application. Thus, independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application are patentable over Ponnappalli. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

U.S. Patent No. 6,291,254

Claims 1-20 of the present application were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,291,254 issued to Chou et al. (hereinafter "Chou"). For the reasons set forth below, this rejection is respectfully traversed.

Chou, like Jones, Yip, and Ponnappalli, fails to disclose the present invention as recited in independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application. Chou, which is directed to techniques for determining integrated circuit process parameters, is altogether not directed to creating a wire load model, and therefore, cannot disclose a curve-fitting engine to create a wire load model or selecting an error-bound for such a curve-fitting engine. With respect to the portions of Chou relied on in the final Office Action of March 5, 2003, namely, column 9, lines 14 – 16, column 10, lines 33 – 37, and column 9, lines 2 - 3 of Chou, Chou is clearly referring to

field solvers, not curve-fitting engines. As apparent from the claims of the present invention, field solvers are distinct from curve-fitting engines. Moreover, as described in Chou, the field solver reiterates until a converged value of an interconnect process parameter is obtained. This is distinct from the selecting of an error bound for a curve-fitting process.

In view of the above, Chou fails to show or suggest the present invention as recited in independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application. Thus, independent claim 19 and amended independent claims 1, 6, 11, and 15 of the present application are patentable over Chou. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

V. Conclusion

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226.102001; P5991).

Respectfully submitted,

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